

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) EP 0 886 250 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.12.1998 Bulletin 1998/52

(51) Int Cl.⁶: G07F 17/32

(21) Application number: 98304882.8

(22) Date of filing: 22.06.1998

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: Phillips, Gareth
Bramhall, Stockport, SK7 1HR (GB)

(74) Representative: Quest, Barry et al
Wilson, Gunn, M'Caw,
41-51 Royal Exchange,
Cross Street
Manchester M2 7BD (GB)

(30) Priority: 20.06.1997 GB 9712896
12.07.1997 GB 9714599

(71) Applicant: BARCREST LIMITED
Ashton-under-Lyne Lancashire OL7 0QQ (GB)

(54) Entertainment machines

(57) A player-operable entertainment machine, of the 'fruit' or 'poker' machine kind, has a main symbol-selector display, such as a reel display (27) and a supplementary games feature display (23). The latter display (23) has a flexible sheet (18) movable over a bank of lamps (21) so that a number of different games feature displays can be selected. The main display (27) is also changeable for example by electronically changing the display on a VDU, in correspondence with the change in the games feature display. Instead of the flexible sheet (18), a flat screen VDU can be used. The range of different games features can be changed by replacing a part of the machine such as the flexible sheet (18), or an electronic memory device. The different games features may be of different levels of difficulty. Game play data may be retained and carried forward with change of games features. The change of games features may be implemented by the player, for example using push buttons (14). Alternatively, change may occur automatically or by external feed of data to the machine.

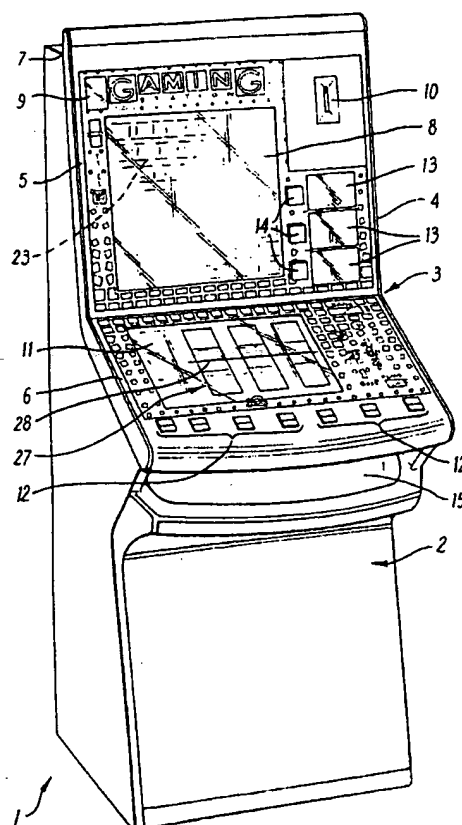


Fig. 1

EP 0 886 250 A1

Description

This invention relates to player-operable entertainment machines, particularly coin-operated amusement machines, such as 'fruit' or 'poker' machines of the kind having a main display device for displaying a selected combination of symbols at a win zone. As used herein the term coin is intended also to cover tokens, charge or credit cards or any other means of supplying credit or monetary value.

GB-2287567-A describes an entertainment machine having a plurality of display regions each having a set of sections which can be back illuminated by lamps from a bank thereof, characterised in that said display regions are regions of a flexible light-transmitting sheet, said sheet being movable between different stopping positions at each of which a respective said region is positioned in front of the said bank of lamps.

With this arrangement different displays corresponding to different game features can be made available to the player on the same machine. This enables the machine to be used in different modes in which different games, or different versions of the same game, can be played. This gives rise to a machine of enhanced versatility and entertainment value and in particular permits operation of a machine in modes of different complexity so that for example an inexperienced player can operate the machine in a simplified mode whereas an experienced player can select a mode in which a game of greater complexity is played. In this way the machine can appeal to a wider range of players.

As specifically described in the prior patent application the machine has a main display device comprising rotatable symbol-bearing reels, and the flexible sheet is in the form of a closed loop which may be printed with say three different so called 'feature' game displays. These feature game displays may comprise 'tracks' along which play can progress, for example in conjunction with a selected number displayed on a supplementary feature reel, progression of play being indicated by back illumination of successive areas of the track.

An object of the present invention is further to promote the versatility and entertainment value of the aforementioned machine.

According to one aspect of the invention therefore there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device comprising a flexible light-transmitting sheet with a plurality of display regions and a bank of lamps for back illuminating the sheet at a supplementary game zone, the sheet being movable between different stopping positions at each of which a respective said display region is positioned in front of the bank of lamps at the supplementary game zone, characterised in that the main display device has a plurality of individually selectable display formats which correspond respectively to the said display regions of the

sheet, and a control device is provided to effect selection of the respective said display format corresponding to the said display region located at the supplementary game zone.

With this arrangement, both the supplementary game display, and the main symbol display are changed together whereby significant machine changes can be made in a convenient manner. This gives rise to much enhanced versatility and entertainment value. The extent of change may be effectively equivalent to a machine model change, but without requiring physical removal and replacement of the machine.

Most preferably the main display device comprises a VDU device, although is desired, other changeable display devices may be used.

The VDU device may be arranged to produce a simulated rotatable reel display in at least one display format.

Alternatively or additionally other types of displays may be used.

In a particularly preferred embodiment, in at least one display format the VDU device is arranged to produce a display of a moving surface, such as a conveyor belt, beneath a plurality of outlets spaced in the direction of movement of the surface, the selected symbols being deposited from the outlets onto the surface.

The VDU device may have a touch sensitive screen to provide player controls, additionally or alternatively to conventional press buttons.

With regard to the flexible sheet and the bank of lamps, these are preferably as described in the above mentioned patent application GB 2287567-A.

The present invention is also concerned with further modifications and improvements in relation to the abovementioned machines.

Thus, and in accordance with a second aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that at least one of said display devices comprises a display screen provided with control means for controlling the production of displayed matter thereon.

As described above in connection with the first aspect of the present invention the main display device may comprise said display screen, which may be a VDU. Alternatively or additionally, the supplementary display device may comprise said display screen which may be an electronic display screen or VDU.

Particularly in the latter case the said electronic display screen may be a plasma screen or other screen of flat form. In this way versatility can be much enhanced

whilst maintaining an attractive display which may closely simulate a conventional back illuminated screen-printed glass panel.

For fast transfer of data to a plasma screen or similar images stored on CDi or CD Rom may be used.

According to a third aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, wherein said supplementary display device has at least a part thereof which determines the range of said selectable display formats, characterised in that said part is replaceable to enable said range to be changed.

In the case where the supplementary display device comprises a back-illuminated flexible light-transmitting sheet having different display regions thereon, as described in GB 2287567-A, provision may be made for removing and replacing the sheet with a different sheet bearing a different range of display regions. Such sheet may be selectable from a range of sheets having different ranges of display regions thereon.

The sheet may be replaced by itself, or it may be replaced in conjunction with other parts, for example as a display module comprising the sheet and support or drive components.

Replacement of the sheet may require opening of the entertainment machine to gain access to the sheet, or provision may be made for replacement to be effected via a slot or other restricted opening which permits removal of the existing sheet and insertion of a new sheet.

In a particularly preferred embodiment, the sheet is a closed loop mounted on wheels or rollers in a display module which is removably mounted within the machine, one or more such wheels or rollers being movable between operational and release positions whereby the sheet is tensioned or gripped for drive in the operational position and is relaxed or disengaged in the release position for easy removal.

There may be other kinds of replaceable parts depending on the construction of the supplementary display device. Thus, for example, where the supplementary display device comprises an electronic screen, there may be a replaceable memory device containing data relevant to a range of different display regions.

In the case where there is a replaceable part as mentioned above, a coding or security arrangement may be provided to ensure that replacement can only be effected by an authorised person or in an authorised manner.

Thus, for example, in the case of a replaceable sheet this may incorporate a bar code or hologram or other material or device which is read or scanned by the

machine for authenticity whereby the machine will only operate correctly after such authentication. Authentication may be necessary in relation to check information which is permanently incorporated in the machine or which is incorporated in a separate component which has to be replaced or inserted into the machine in correspondence with replacement of the sheet. This separate component may be a memory component and to control the main display. Alternatively or additionally authentication may be in relation to check data which has to be entered into the machine via a local or remote interface such as an internal machine device, remote on-line telephone link, local infra-red link, etc. and this may be associated with data used to change the main display.

This authentication may equally be necessary in the case of replacement of parts other than sheets, as discussed above.

According to a fourth aspect of the present invention there is provided a player operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that the different display regions of the said range thereof correspond to games of successively increased difficulty.

With this arrangement versatility and interest can be much enhanced.

The nature of the increased difficulty may be such that increased player involvement is required or is made available whereby the player has to exercise greater knowledge or expertise to attain wins which wins may correspondingly be of a more extensive nature. Thus, for example, with games of greater difficulty there may be more options or actions for the player, such as increased use of 'hold' or 'nudge' or 'gamble' options, and features of greater complexity in the supplementary game.

According to a fifth aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that game play data is maintained on change of the selected said supplementary display region.

In this way, provision can be made for transferring or maintaining data arising from play, such as game credit, accumulated nudges or other awards, jackpot ac-

cumulation, etc, whereby after playing a game with one display region, the player can switch to a different game with a different display region without loss of the game credit or other data current in the first game.

Also, internal control parameters may be sustained notwithstanding switching of play between different games, as for example win compensation data, pay out level data, feature frequency data, etc.

According to a sixth aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that multiple player controls are provided corresponding respectively to the different said display regions whereby selection of a said display region can be effected by player operation of the respective said control.

In this way the player can be given the opportunity of selecting the game which he wishes to play.

According to a seventh aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that there is provided an automatic display changing device operable to change automatically the selected said display region in accordance with predetermined change parameters.

With this arrangement change of the display region may be effected as a consequence of the course of game play. Thus, on reaching a predetermined point, or score or accumulation of credit or other features, the display region may automatically change thereby changing the game presented to the player. This may be effected on the basis of increasing variety, or to award player activity. By way of example, on attaining a target score or award level, the game may change automatically to a more difficult or more rewarding game.

Alternatively or additionally, change of the display region may be in accordance with parameters other than those related to game play e.g. in accordance with the time of the day or player activity or takings or otherwise.

According to an eighth aspect of the present invention there is provided a player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary

game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that there is provided an interface link to permit input of data to the machine externally thereof to effect change of the selected said display region.

With this arrangement the display region can be changed e.g. by a site manager using a plug in or infrared link or by operating a keyboard or the like within the machine after opening an access door. Alternatively or additionally the display region may be changeable from a remote location using an on-line telephone link or the like. Such change of the display region may constitute change with the said range and/or change of the entire range.

Where reference is made above to change of the display region this may be a complete change of the entire region in the sense that the multiple elements making up the region are changed with regard to positions and kind and interrelationship with each other so that, for example, there is a different picture or displayed track or course or the like. Alternatively however the change may be of a positional stepwise nature whereby for example the displayed multiple elements are moved positionally but not otherwise changed as for example by moving a display down through one or more steps. It is also possible to change an area of a region without changing other areas thereof.

These stepwise or regional changes may be utilised as a feature change or modification within a game, or to give a moving or changing feature effect within a game, rather than changing a game in its entirety.

The various aspects of the invention as described above may be utilised in any combination with each other and with the aspects of GB 2287567-A as appropriate.

The invention will now be described further by way of example only and with reference to the accompanying drawing in which:-

- Fig. 1 is a diagrammatic perspective view of one form of a fruit machine according to the invention;
- Fig. 2 is a block circuit diagram of the machine;
- Fig. 3 is a perspective view of a supplementary display device of the machine;
- Fig. 4 is a front view of a main display device of the machine in a different display format to that shown in Fig. 1.

Referring to Fig. 1, this shows a fruit machine having a floor-standing box-shaped housing 1 with a front wall 2 having a stepped upper structure 3 defined by a metal frame 4 supporting upper and lower printed glass panels 5, 6.

The frame 4 is hinged at its top edge 7 so that it can be moved upwardly and forwards to provide access to the interior of the housing.

The upper glass panel 5 is generally upright when the frame 4 is closed, whereas the lower panel 6 is at a small angle to the horizontal.

The upper glass panel 5 is printed to define a large square or rectangular central clear 'feature game' window 8 bounded by decorative and informative matter. There is also a smaller 'feature reel' window 9, and the frame 4 has a coin slot 10.

The lower glass panel 6 is printed to define a large square or rectangular central clear main display window 11 bounded by decorative and informative matter. There are also player operable press buttons 12, 13, 14.

There is a payout opening 15 in the front wall 2 below the frame 4.

Within the housing there are mounted behind the upper panel 5, a coin mechanism 16 to receive coins inserted through the slot 10, a supplementary game display device 17 mounted behind the window 8, and a feature reel 19 mounted behind the small window 9.

The supplementary game display device 17 is shown in Fig. 3 and comprises a continuous loop of flexible transparent or light transmitting sheeting 18 which runs around upper and lower rollers 19, 20 so that a front planar run of the sheeting 18 is located in superimposed relationship with the window 8.

A bank of lamps 21 is mounted behind this front run for back illumination purposes.

A controllable drive mechanism 22 is provided which is operable to move the sheet 18 between three stopping positions at each of which there is a respective different supplementary game display region 23 within the window 8.

The construction of the supplementary display device 17 will be further described hereinafter.

The feature reel 19 comprises a reel with numbers or other symbols at spaced intervals around its periphery, and a stepper motor 19a is operable to rotate the reel 19 and bring this to rest with one of the symbols displayed through the window 9.

Also within the housing 1, behind the lower front panel 2, there is a VDU 24, which may be of the CRT type or of the LCD or plasma or other flat screen type. This produces a screen display which can be seen through the window 11.

As an alternative to some or all of the above mentioned push buttons 12-14, the VDU may have a touch sensitive screen.

As can be seen from Fig. 2, the various electrical and electronic devices described above, namely the controllable drive mechanism 22, the bank of lights 21, the feature reel motor 19, the coin mechanism 16, the VDU 24, the press buttons 12-14, and also a payout mechanism 25 within the housing connected to the payout outlet 15, are all connected to a microprocessor based operating system 26.

In use, the player inserts coins into the coin mechanism 16 through the slot 10 sufficient to generate credit for one or more games and the machine is actuated so

that a game can now be played.

At this stage, the VDU 24 shows a main game display which, as indicated in Fig. 1 may represent say three side by side rotatable symbol-bearing reels 27, each reel displaying three such symbols, when at rest, centred on a horizontal win line 28.

Adjacent to the reel display 27 on the VDU 24 there may be other displays of a decorative or informative nature.

The bank of lamps 21 comprises a matrix of say 32x32 lamps and these are selectively actuated so that the display region 23 of the sheet which is in the window 8 is back illuminated. The display region 23 may be printed with a suitable fruit machine feature game such as a track or board game squares, or positions on a roulette wheel or the like. The back illumination may constitute random flashing or static illumination of selected areas of the display region 23. The sheet also has two further display regions at spaced locations thereon and these are printed with different feature game displays.

The lamps 21 illuminate multiple elements of the display region. Such elements may be individual squares or other units or may constitute a continuous display extending over an area of the display region.

The player can start a game by pressing a start button 12. The reels 27 then spin on the main display 23, or rather the display simulates such movement, and the reels 27 then come to rest with a selected combination of symbols displayed on the win line 28. The displayed symbol combination is assessed by the control unit 26 and a win indication is given in the event that the combination is of a predetermined winning nature.

Control buttons 12 can be used to perform 'hold' or 'nudge' functions when made available to the player, so that the player can seek to influence the outcome of a game, in conventional manner. The availability of a hold or nudge feature is signalled on the VDU 24 by appearance of a flashing word 'hold' or 'nudge' or otherwise.

In conventional manner, for example when special symbols are displayed on the win line 28, or on some other basis, play can transfer to the feature game on the display region 23 where the player may have the opportunity of obtaining further, or enhanced wins. At this stage, the feature reel 19 rotates and then comes to rest to display a selected symbol, and then play progresses around the track on the display region 23 by back illumination of successive squares or areas of the track, or otherwise.

The player has the option, for example, after establishing game-playing credit but before starting a game, to select the kind of game to be played.

There may be three different games and each may be selected by successive operation of a special one of the press buttons 12.

Each time the button 12 is pressed, the sheet 18 rotates to the next display region position. The different display regions 23 present different displays in the window 8. These may have different layouts of tracks and/

or different types or frequencies or sequences or magnitudes of awards associated with the tracks, or any other differing features.

Also, each time the button 12 is pressed the display on the VDU 23 changes in correspondence with the change in the display region 23. For example, in the case where the display region 23 has a distinctive theme or style, the VDU display may also be changed to incorporate the same theme or style.

In the case where the changes of the feature game provide differing levels or complexity or award levels, the changes in the VDU display may be of a corresponding nature whereby for example the sequences of selectable reel symbols may differ with regard to factors such as complexity, supplementary symbol type and frequency, win likelihood, etc.

The VDU display may in each case simulate rotatable reels. Alternatively however, and as shown in Fig. 4, the VDU display may be of a different nature.

As shown in Fig. 4, the display may represent a movable conveyor belt 31 across the bottom of the screen with a row of outlet pipes 32 above the belt 31. Selection of symbols is achieved by depositing symbols 33 e.g. three dimensional representations of fruit onto the belt 31. The belt 31 is static when a selected combination of symbols 33 is displayed. Otherwise the belt moves to dispose of deposited symbols.

The microprocessor circuitry 26 coordinates and controls the change in display region 23, the change in pattern of actuation of the lamps 21, the switching of the VDU display 24, as well as the change in game operational procedure, in response to player actuation of the button 12 and in accordance with the operating software of the circuitry 26.

With this arrangement, the machine as described can be operated in three completely different modes which gives enhanced versatility and entertainment value.

The game changing may be such as to enable players to select a level of complexity suited to their respective abilities. Alternatively, the game changing may be effectively equivalent to changing of a machine model, to sustain interest at a particular site, without requiring physical replacement of the machine.

Although reference is made to three different games, there may of course be any suitable number. Also, the invention is not restricted to an arrangement in which the different games are player selectable. Selection may alternatively or additionally be effected automatically in accordance with a predetermined routine (e.g. by changing after set numbers of games, or at random or whenever an event occurs such as a win or absence of wins or time of day or the like). It is also possible to provide for changes to be made within the machine or externally or at a remote location by a person other than the player, such as an authorised site operator or machine owner or the like.

In accordance with a modification of the above de-

scribed machine, and as shown in the drawings, the upper panel has three small rectangular windows 13 arranged one above the other and alongside each there is a respective press button 14 operable through apertures in the panel 5.

The player has the option, for example, after establishing game-playing credit but before starting a game, to select the kind of game to be played, corresponding to the three different display regions 23 on the sheet 18.

There may be three different games and each may be selected by successive operation of one of the press buttons 14. Each window 13 has decorative/informative matter displayed therethrough from behind and which identifies a respective selectable game.

When one of the buttons 14 is pressed, the sheet 18 rotates to bring the display region 23 on the sheet 18 which corresponds to the feature game indicated in the window 13 adjacent to the button 14 which has been pressed to a position at which it is displayed in the window 8.

The panels 5, 6 are standardised in that the decorative/informative material around the windows 8, 9, 11, 13 is of a generalised nature applicable to different kinds of games. The displays specific to the three games available are presented through windows 8 and 11 and can be changed in correspondence with selection of the games using the buttons 14 by movement of the sheet 18 and by electronic adaptation of the display on the VDU 24.

The standardisation of the panels 5, 6 also permits ready change of the entire range of three games.

In this respect, reference is made to Fig. 3 from which it can be seen that in addition to the rollers 19, 20, there are rollers 19a, 20a whereby the sheet moves around four rollers disposed trapezoidally. The four rollers 19, 20, 19a, 20a are mounted between end plates 29 of an open fronted box structure whereby the supplementary display device 17 is of the form of a module made up of the rollers, 19, 20, 19a, 20a, the sheet 18, the box structure with the end plates 29 and the drive unit 22.

The light box 21 may be incorporated as part of the module or may be a separate structure insertable removably into a position of use through a side opening. As an alternative to a light box behind the sheet it is possible to use an arrangement of optical fibres or other light guides or means for reflecting or projecting light to achieve requisite illumination.

The module described above is removably mounted within the machine to facilitate access thereto.

The rollers 19a, 20a are mounted on the end plates 29 so as to be movable inwardly (i.e. towards the rollers 19, 20) so that the tension on the sheet 18 is released or slackened. As shown, the rollers 19a, 20a are mounted on the end plates 29 in slots 30. The rollers 19a, 20a are normally held in outermost positions, e.g. by spring tensioning and/or by engagement with retaining abutments at the slot ends. The rollers 19a, 20a can be man-

ually pushed inwards along the slots 30 against the spring or abutment retention. In this inward position the sheet loop can be readily detached by sideways sliding off the rollers 19, 20, 19a, 20a and a replacement sheet can be moved sideways into position around the rollers. The rollers 19a, 20a can then be moved outwards in the slots 30 to be held in position by the spring tension or by click-fit engagement beyond the abutments.

In this way the sheet can be readily replaced to present display regions appropriate to a different range of three games. At the same time the display material behind the three windows 13 can be changed.

In so far as it is necessary also to change the main display on the VDU, this can be achieved by replacement of a plug in programme module or EPROM or other memory device in the control system 26, or by other change of data used by the system e.g. by on-line or other remote link.

As a security factor, the sheet may be security coded (e.g. with a bar code) in corresponding manner to the changed game programme data so that the machine will only function correctly if the code read or scanned off the sheet (by a code reader or scanner not shown) checks against the code in the new game data.

It is of course to be understood that the invention is not intended to be restricted to the details of the above embodiment which are described by way of example only.

Claims

1. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device comprising a flexible light-transmitting sheet with a plurality of display regions and a bank of lamps for back illuminating the sheet at a supplementary game zone, the sheet being movable between different stopping positions at each of which a respective said display region is positioned in front of the bank of lamps at the supplementary game zone, characterised in that the main display device has a plurality of individually selectable display formats which correspond respectively to the said display regions of the sheet, and a control device is provided to effect selection of the respective said display format corresponding to the said display region located at the supplementary game zone.
2. A machine according to claim 1 characterised in that the main display device comprises a VDU device.
3. A machine according to claim 2 characterised in that the VDU device is arranged to produce a simulated rotatable reel display in at least one display

format.

4. A machine according to claim 2 or 3 characterised in that in at least one display format the VDU is arranged to produce a display of a moving surface beneath a plurality of outlets spaced in the direction of movement of the surface, the selected symbols being deposited from the outlets onto the surface.
5. A machine according to any one of claims 2 to 4 characterised in that the VDU device has a touch sensitive screen to provide player controls.
6. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that at least one of said display devices comprises a display screen provided with control means for controlling the production of displayed matter thereon.
7. A machine according to claim 6 characterised in that the main display device comprises said display screen which is a VDU device.
8. A machine according to claim 6 or 7 characterised in that the supplementary display device comprises said display screen which is a VDU device.
9. A machine according to claim 8 characterised in that the screen is a flat screen.
10. A machine according to claim 9 characterised in that a CDI or CD Rom is used for transfer of data to the screen.
11. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, wherein said supplementary display device has at least a part thereof which determines the range of said selectable display formats, characterised in that said part is replaceable to enable said range to be changed.
12. A machine according to claim 11 wherein said sup-

plementary display device comprises a back-illuminated flexible light-transmitting sheet characterised in that provision is made for removing the sheet and replacing this with a different sheet bearing a different range of display regions.

13. A machine according to claim 12 characterised in that the sheet is replaceable as a display module comprising the sheet and support or drive compartments.

14. A machine according to claim 13 characterised in that the sheet is a closed loop mounted on wheels or rollers in a display module which is removably mounted within the machine, one or more such wheels or rollers being movable between operational and release positions whereby the sheet is tensioned or gripped for drive in the operational position and is relaxed or disengaged in the release position for easy removal.

15. A machine according to any one of claims 11-14 wherein the supplementary device comprises an electronic screen characterised in that a replaceable memory device is provided containing data relevant to a range of different display regions.

16. A machine according to any one of claims 11-15 characterised by the provision of a coding or security arrangement associated with the replaceable part.

17. A machine according to claim 16 when dependent on claim 12 characterised in that the sheet incorporates a code which is read by the machine for authenticity.

18. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that the different display regions of the said range thereof correspond to games of successively increased difficulty.

19. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective

said display region at said supplementary game zone, characterised in that game play data is maintained on change of the selected said supplementary display region.

20. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that multiple player controls are provided corresponding respectively to the different said display regions whereby selection of a said display region can be effected by player operation of the respective said control.

21. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that there is provided an automatic display changing device operable to change automatically the selected said display region in accordance with predetermined change parameters.

22. A player-operable entertainment machine having a main display device for displaying a selected combination of symbols at a win zone, and a supplementary display device arranged to produce a region of multiple display elements at a supplementary game zone, said supplementary display device having a range of individually selectable display formats in each of which there is a different respective said display region at said supplementary game zone, characterised in that there is provided an interface link to permit input of data to the machine externally thereof to effect change of the selected said display region.

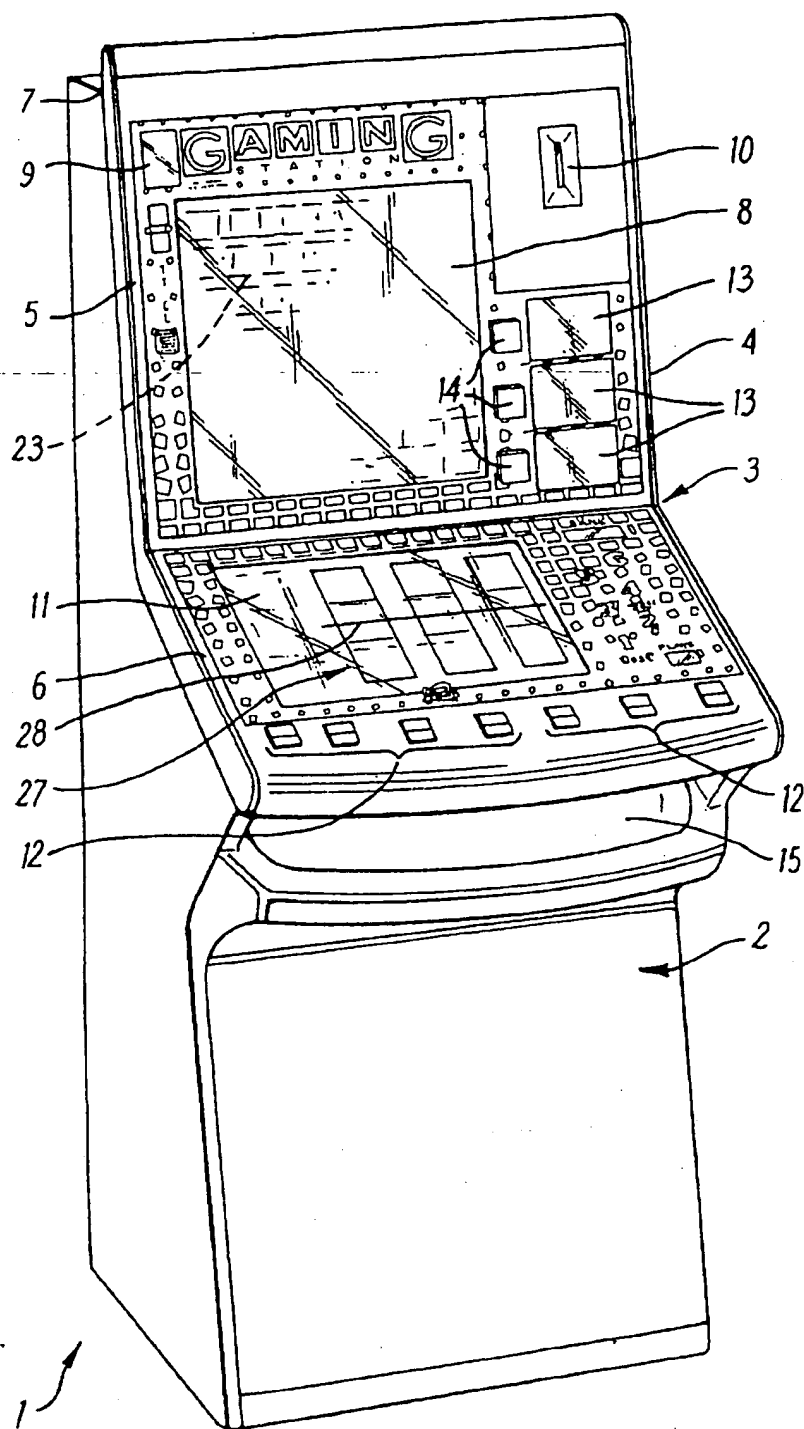


Fig. 1

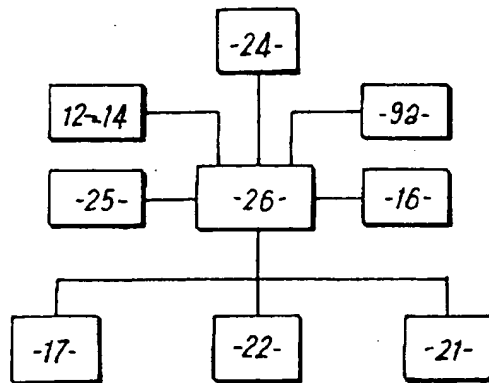


FIG. 2

FIG. 3

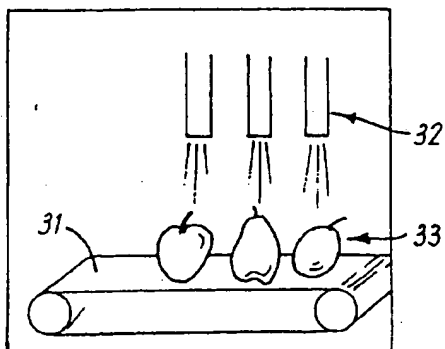
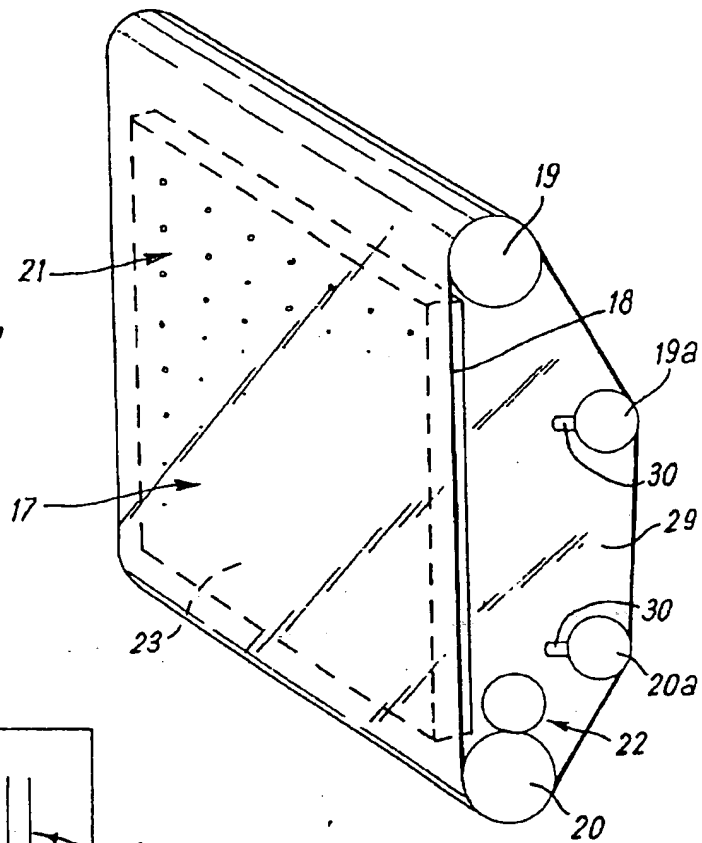


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 4882

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 431 724 A (SNK CORPORATION) 12 June 1991	6-9,11, 15,20	G07F17/32
Y	* column 2, line 13 - column 3, line 19; figures *	1,2,12	
A	---	16,17,21	
D,X	GB 2 287 567 A (BARCREST) 20 September 1995	18,19	
Y	* page 10, line 7 - page 11, line 6 *	1-3,5-9, 11,12, 15,20-22 13,14	
A	---		
Y	US 5 575 717 A (HOURIET, JR. ET AL.) 19 November 1996	1-3,5-8, 20	
A	* column 3, line 33 - column 4, line 18; figures *	11	
Y	DE 44 26 582 A (NSM AG) 1 February 1996	1-3,6-9, 20,21	
A	* column 3, line 51 - column 4, line 8; figure *	18	
Y	EP 0 253 584 A (BELL-FRUIT) 20 January 1988	1-3,11, 12,15, 21,22	G07F
A	* column 2, line 28 - column 4, line 10; figure 1 *	6-10,16, 17	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 2 October 1998	Examiner Neville, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P4/C01)

ADDENDUM TO P05326

Here is the info. needed:

Acceptable range of machine parameters (20%) of listed conditions.

Mold setting:

Cure time: 80 sec. However, this cure time will be mold compound- and temperature-dependent. Initiators and catalysts can be added in a number of combinations so to either speed up, or slow down, the reaction time to reach a B-stage state - sufficiently rigid to allow for mold removal without damaging the parts, for post mold cure. Reaction speed needs to be balanced with the injection speed. A slow injection speed combined with fast reaction will lead to a rapid increase in the compound viscosity, which may lead to a host of flow-induced problems such as wire sweep, voiding, and incomplete fill.

Injection setting: 170°C. This is the general mold setting, although some applications may call for settings as low as 150°C and as high as 200°C. With the latter setting, the mold compound can reach a sufficiently advanced cured state that post curing is no longer needed.

Clamp pressure: 18-20 tons. This is the machine setting to keep the two mold halves clamped shut. This value will be machine- and mold-dependent. A production mold will be larger, and with the heavier mass, will require more clamping tonnage. The values listed apply to the Towa (model M60) mold press used in NSC prototype Pilot Line lab.

Injection setting:

Transfer pressure: 0.18 ton. This is the hydraulic force applied to the transfer plunger. We use a cylindrical mold compound pellet of 14 mm in diameter and weighing 3.8 gm. This translates into a transfer pressure of 1,690 psi (or 1.16 kg/mm²).

Transfer speed: 1.8 to 2.0 m/s. The transfer speed controls the shear rate imparted to the mold compound as it flows into the mold cavities. Shear rate is the ratio of flow front velocity over the gap that the front has to flow through. Its unit is inverse sec (s⁻¹). For the same transfer speed, the shear rate will vary as the gap is increased or decreased. In a mold cavity, the key gaps are the cross-section of the runner (from the pot containing the pellet), the gate (opening into the mold cavity), and the cavity upper and lower gaps (delineated by the leadframe or substrate). For the LLP mold setting, the shear rates are estimated to be about 380 s⁻¹, 8,100 s⁻¹, 430 s⁻¹ for the runner, gate, and cavity, respectively. Such numbers are based on the flow front velocity estimated at each one of those locations. It is important to maintain those (machine-independent) settings to ensure that the proper filling of the mold cavity can be achieved. Again, variations within 20% of these values are acceptable.

Clamp pressure:

Chase pressure: 2 tons. Some mold presses have a two-stage clamping process. Large (global) clamping to provide rough clamping of large platens, and small (local) clamping on the chase area. What this does is to ensure that the large pressure does not all come down on the leadframe or substrate, and crush the material. The small local clamping allows more flexibility in fine-tuning the local pressure on certain areas of the mold and substrate or leadframe. Older presses have only one clamp pressure setting.